



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/653,157	08/31/2000	Kevin J. Torek	MI22-1376	4651

21567 7590 11/28/2001

WELLS ST JOHN ROBERTS GREGORY AND MATKIN
SUITE 1300
601 W FIRST AVENUE
SPOKANE, WA 992013828

EXAMINER

DEO, DUY VU

ART UNIT	PAPER NUMBER
----------	--------------

1765

DATE MAILED: 11/28/2001

5

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/653,157

Applicant(s)

TOREK ET AL.

Examiner

DuyVu n Deo

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4, 7, 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Harada et al. (US 5,631,868).

Harada describes a method for removing an organic compound such as photoresist from a semiconductor substrate comprising: feeding an oxygen gas having a purity of at least 99.999% (this feed gas or oxygen would comprise less than or equal to 0.001% of N₂) through an ozone generator to generate ozone; and contacting the ozone with the resist on the substrate to remove the resist (col. 2, line 56-60; col. 7, line 5, line 38-40; col. 9, line 26-30).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2, 3, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada as applied to claims 1 and 7 above, and further in view of Ury et al. (US 4,885,047).

Unlike claimed invention, Harada doesn't describe irradiating at least some of the ozone with UV prior to the contacting. Ury describes a same method of removing resist wherein he

Art Unit: 1765

teaches of using ozone and irradiating the resist with during the process. Some of the ozone would have to be irradiated with UV to create ozone fragments prior to the contacting and proximate the resist during the process. (col. 4, line 19-39). It would have been obvious for one skill in the art to modify Harada in light of Ury because Ury teaches that UV may provide an enhancement of the stripping time.

5. Claims 5, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada as applied to claims 1 and 7 above, and further in view of De et al. (JP411219926A).

Unlike claimed invention, Harada doesn't describe mixing ozone with water vapor prior to contacting. However, removing resist with ozone and water vapor has been known to one skill in the art at the time of the invention such as one taught by De (ab.). Therefore, at the time of the invention one skill in the art would find it obvious to remove resist in light of De by using ozone and water vapor, which would enhances the removal process since water would provide another source of oxidizing agent to remove the photoresist with an anticipation of an expected result.

6. Claims 6, 11-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada and Ury as applied to claims 1, 7 above, and further in view of Shirai et al. (US 5,683,857).

Unlike claimed invention, above prior art doesn't describe mixing the ozone with organic solvent vapor prior to the contacting. Shirai describes a method of developing the resist wherein the resist is removed using a combination of oxygen, UV, and organic solvent vapors such as acetone, cyclohexanone, isopropanol (col. 6, line 45-60; col. 8, line 35-54). Even though Shirai doesn't describe mixing organic solvent with ozone prior to the contacting. However, it would

Art Unit: 1765

be obvious to one skill in the art at the time of the invention that using organic solvent vapor with oxidizing agent including oxygen and ozone would be able to remove the resist with an anticipation of an expected result. The oxidizing agent such as oxygen and ozone would have to be mixed with the organic vapor in the air prior to contacting the substrate.

Referring to claim 16, 17, it would be obvious that the organic solvent such as acetone, cyclohexanone, would be a liquid and its reservoir can be anywhere within or outside the chamber as long it could provide organic vapor for the resist removal.

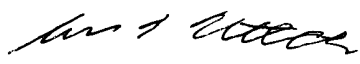
Referring to claims 22, 23, 31, and 32, it would be obvious for one skill in the art to use other organic solvent vapors including claimed propylene glycol or a mixture of cyclohexanone and PGMEA to remove the resist with an anticipation of an expected result.

Referring to claims 14, 15, 34, and 35, using the resist to etch a substrate that includes aluminum oxide or platinum are known to one skill in the prior and would depending on the type of device being processed (please see below cited art). Removing the resist would also expose the aluminum oxide or Pt to the ozone.

7. Nomoto (US 6,133,603) and Dahlheim et al. (US 5,540,047) cited to show prior art.
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DuyVu n Deo whose telephone number is 703-305-0515.

DVD

November 19, 2001


BENJAMIN L. UTECH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700